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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/872,454	05/31/2001	Svend Frolund	10010653-1	3017

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EXAMINER	
MCCARTHY, CHRISTOPHER S	

ART UNIT	PAPER NUMBER
2113	2

DATE MAILED: 03/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/872,454	FROLUND ET AL.	
	Examiner	Art Unit	
	Christopher S. McCarthy	2113	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 May 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 May 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: Page 4, line 28, reads "suspicions", wherein, the word should be in singular form. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 1-5, and 8-15, and 18-20 are rejected under 35 U.S.C. 102(a) as being anticipated by Moser "Eternal: Fault Tolerance and Live Upgrades for Distributed Object System".

As per claim 1, Moser teaches a hierarchical method for fault tolerance in a distributed computer system (section 2, paragraph 1, lines 1-6): providing a plurality of data centers (section 2, paragraph 3); providing a plurality of objects in each of the plurality of data centers (section 2, paragraph 3); using a local sub-protocol for dissemination of messages within a data center in the plurality of data centers (section 2, paragraph 3; section 6.2.1); and activating the local sub-protocol from another data center of the plurality of data centers in a single round-trip message in the absence of faults (section 2, paragraph 5, lines 8-10). A single round-trip is inherent in the FTMP protocol cited by Moser. For further explanation of this protocol, please refer to Moser "A Group Communications Protocol for CORBA" as included in the PTO-892 of this action.

As per claim 2, Moser teaches the hierarchical method as claimed in claim 1 wherein: using the local sub-protocol uses an atomic broadcast protocol (section 2, paragraph 5; section 4, paragraph 2), wherein, the protocol, as taught by Moser, keeps the messages in total order to the objects and is to all the objects. This fulfills the definition of atomic broadcast protocol, as given the disclosure on page 3, paragraph 2, as "messages delivered in the same order to all objects."

As per claim 3, Moser teaches the hierarchical method as claimed in claim 1 wherein: using the local sub-protocol uses an atomic broadcast protocol (section 2, paragraph 5; section 4, paragraph 2) and invokes the plurality of objects in the data center (section 6.2.1, paragraph 1, lines 1-4 and paragraph 2, lines 1-6).

As per claim 4, Moser teaches the hierarchical method as claimed in claim 1 wherein: using the local sub-protocol uses an atomic broadcast protocol and invokes the plurality of objects in other of the plurality of data centers by sending propagation messages; and including: responding to the propagation message in the other of the plurality of data centers activates a local atomic broadcast protocol (section 2, paragraph 6, lines 1-5 and paragraph 5, lines 8-10).

As per claim 5, Moser teaches the hierarchical method as claimed in claim 1 wherein: using the local sub-protocol uses an atomic broadcast protocol and invokes the plurality of objects in other of the plurality of data centers by sending a propagation message; and including: responding to the propagation message in the other of the plurality of data centers includes providing an acknowledgement to the data center in the plurality of data centers from one of the plurality of objects therein (section 2, paragraph 5, lines 8-10). An acknowledgment is inherent in the FTMP protocol cited by Moser. For further explanation of this protocol, please refer to

Moser "A Group Communications Protocol for CORBA" as included in the PTO-892 of this action.

As per claim 8, Moser teaches the hierarchical method as claimed in claim 1 wherein: activating the local sub-protocol includes using a unique identifier (section 4, paragraph 1).

As per claim 9, Moser teaches the hierarchical method as claimed in claim 1 wherein: providing the plurality of objects includes providing a primary object in one of the plurality of data centers that communicates with the other of the plurality of data centers (section 6.2.1, paragraph 1, lines 1-4).

As per claim 10, Moser teaches the hierarchical method as claimed in claim 1 wherein: using the local sub-protocol includes detecting failures within the plurality of objects within each of the plurality of data centers (section 6.3).

As per claim 11, Moser teaches the hierarchical method as claimed in claim 1 wherein: using the local sub-protocol includes determining when faults occur in the plurality of objects in a local data center (section 6.3).

As per claim 12, Moser teaches the hierarchical method as claimed in claim 1 wherein: using the local sub-protocol includes determining when faults occur in the plurality of objects in a local data center; and including: determining an alternate object in the plurality of objects in the local data center to become a backup primary object when a primary object has a fault (section 6.3).

As per claim 13, Moser teaches the hierarchical method as claimed in claim 1 wherein: using the local sub-protocol includes developing a suspicion of the occurrence of faults in the plurality of objects in a local data center; and including: determining an alternate object in the

plurality of objects in the local data center to become a backup primary object when a primary object has a fault (section 6.3).

As per claim 14, Moser teaches a hierarchical method for fault tolerance in a distributed computer system (section 2, paragraph 1, lines 1-6): providing a plurality of data centers (section 2, paragraph 3); providing a plurality of objects in each of the plurality of data centers (section 2, paragraph 3); using a local sub-protocol including an atomic broadcast protocol for fault-tolerant dissemination of messages within a data center in the plurality of data centers (section 2, paragraph 3; section 6.2.1); and activating the local sub-protocol from another data center of the plurality of data centers using a propagation message sent in a fault-tolerant manner in a single round-trip message in the absence of faults (section 2, paragraph 5, lines 8-10). A single round-trip is inherent in the FTMP protocol cited by Moser. For further explanation of this protocol, please refer to Moser "A Group Communications Protocol for CORBA" as included in the PTO-892 of this action.

As per claim 15, Moser teaches the hierarchical method as claimed in claim 14 including: responding to the propagation message in the other of the plurality of data centers includes providing an acknowledgement to the data center in the plurality of data centers from one of the plurality of objects therein (section 2, paragraph 5, lines 8-10). An acknowledgment is inherent in the FTMP protocol cited by Moser. For further explanation of this protocol, please refer to Moser "A Group Communications Protocol for CORBA" as included in the PTO-892 of this action.

As per claim 18, Moser teaches the hierarchical method as claimed in claim 14 wherein: activating the local sub-protocol includes using the propagation message with a unique identifier (section 4, paragraph 1).

As per claim 19, Moser teaches the hierarchical method as claimed in claim 14 wherein: using the local sub-protocol to determine when faults occur in the plurality of objects in a local data center; and including: determining an alternate object in the plurality of objects in the local data center to become a backup primary object when a primary object has a fault (section 6.3).

As per claim 20, Moser teaches the hierarchical method as claimed in claim 14 wherein: using the local sub-protocol to developing a suspicion of the occurrence faults in the plurality of objects in a local data center; and including: determining an alternate object in the plurality of objects in the local data center to become a backup primary object when a primary object has a fault (section 6.3).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 6-7, and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moser in view of Ma et al. U.S. Patent 6,018,805.

As per claim 6, Moser teaches the hierarchical method as claimed in claim 1 wherein: using the local sub-protocol uses an atomic broadcast protocol and invokes the plurality of

objects in other of the plurality of data centers by sending a propagation message; and including: responding to the propagation message in the other of the plurality of data centers includes providing an acknowledgement to the data center in the plurality of data centers from one of the plurality of objects therein (section 2, paragraph 5, lines 8-10). An acknowledgment is inherent in the FTMP protocol cited by Moser. For further explanation of this protocol, please refer to Moser "A Group Communications Protocol for CORBA" as included in the PTO-892 of this action. However, Moser does not teach waiting a time for the acknowledgement and sending a second propagation message to another of the plurality of objects in the other of the plurality of data centers if the acknowledgement is not received within the time. Ma does teach waiting a time for the acknowledgement and sending a second propagation message to another of the plurality of objects in the other of the plurality of data centers if the acknowledgement is not received within the time (column 5, lines 32-50). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the message process of Ma in the fault tolerance system of Moser. One of ordinary skill in the art would have been motivated to utilize the message process of Ma in the fault tolerance system of Moser because the process of Ma of failing over to a different server object with the same replicated data allows for quicker recovery of the data to the user, a need explicitly desired by Moser (section 1, paragraph 1, lines 7-12).

As per claim 7, Moser teaches teaches the hierarchical method as claimed in claim 1 wherein: using the local sub-protocol uses an atomic broadcast protocol and invokes the plurality of objects in other of the plurality of data centers by sending a propagation message; and including: responding to the propagation message in the other of the plurality of data centers

includes providing an acknowledgement to the data center in the plurality of data centers from one of the plurality of objects therein (section 2, paragraph 5, lines 8-10). An acknowledgment is inherent in the FTMP protocol cited by Moser. For further explanation of this protocol, please refer to Moser "A Group Communications Protocol for CORBA" as included in the PTO-892 of this action. However, Moser does not teach waiting a time for the acknowledgement and sending a second propagation message to another of the plurality of objects in the other of the plurality of data centers if the acknowledgement is not received within the time. Ma does teach waiting a time for the acknowledgement and sending a second propagation message to another of the plurality of objects in the other of the plurality of data centers if the acknowledgement is not received within the time (column 5, lines 32-50). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the message process of Ma in the fault tolerance system of Moser. One of ordinary skill in the art would have been motivated to utilize the message process of Ma in the fault tolerance system of Moser because the process of Ma of failing over to a different server object with the same replicated data allows for quicker recovery of the data to the user, a need explicitly desired by Moser (section 1, paragraph 1, lines 7-12). Although Moser does not explicitly describe sending the first and second propagation messages includes sending first and second unique identifiers; Moser does teach "Each object group has a unique object group identifier" (section 4, paragraph 1, lines 4-5). Therefore, when the message process of Ma is utilized in the system of Moser, it is inherent that the different connections, as used by Ma, would consist of different unique identifiers according to the group identifiers of Moser.

As per claim 16, Moser teaches the hierarchical method as claimed in claim 14 including: responding to the propagation message in the other of the plurality of data centers includes providing an acknowledgement to the data center in the plurality of data centers from one of the plurality of objects therein (section 2, paragraph 5, lines 8-10). An acknowledgment is inherent in the FTMP protocol cited by Moser. For further explanation of this protocol, please refer to Moser "A Group Communications Protocol for CORBA" as included in the PTO-892 of this action. However, Moser does not teach waiting a time for the acknowledgement and sending a second propagation message to another of the plurality of objects in the other of the plurality of data centers if the acknowledgement is not received within the time. Ma does teach waiting a time for the acknowledgement and sending a second propagation message to another of the plurality of objects in the other of the plurality of data centers if the acknowledgement is not received within the time (column 5, lines 32-50). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the message process of Ma in the fault tolerance system of Moser. One of ordinary skill in the art would have been motivated to utilize the message process of Ma in the fault tolerance system of Moser because the process of Ma of failing over to a different server object with the same replicated data allows for quicker recovery of the data to the user, a need explicitly desired by Moser (section 1, paragraph 1, lines 7-12).

As per claim 17, Moser teaches the hierarchical method as claimed in claim 14 including: responding to the propagation message in the other of the plurality of data centers includes providing an acknowledgement to the data center in the plurality of data centers from one of the plurality of objects therein (section 2, paragraph 5, lines 8-10). An acknowledgment is inherent

in the FTMP protocol cited by Moser. For further explanation of this protocol, please refer to Moser "A Group Communications Protocol for CORBA" as included in the PTO-892 of this action. However, Moser does not teach waiting a time for the acknowledgement and sending a second propagation message to another of the plurality of objects in the other of the plurality of data centers if the acknowledgement is not received within the time. Ma does teach waiting a time for the acknowledgement and sending a second propagation message to another of the plurality of objects in the other of the plurality of data centers if the acknowledgement is not received within the time (column 5, lines 32-50). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the message process of Ma in the fault tolerance system of Moser. One of ordinary skill in the art would have been motivated to utilize the message process of Ma in the fault tolerance system of Moser because the process of Ma of failing over to a different server object with the same replicated data allows for quicker recovery of the data to the user, a need explicitly desired by Moser (section 1, paragraph 1, lines 7-12). Although Moser does not explicitly describe sending the first and second propagation messages includes sending first and second unique identifiers; Moser does teach "Each object group has a unique object group identifier" (section 4, paragraph 1, lines 4-5). Therefore, when the message process of Ma is utilized in the system of Moser, it is inherent that the different connections, as used by Ma, would consist of different unique identifiers according to the group identifiers of Moser.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Please see the attached PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher S. McCarthy whose telephone number is (703)305-7599. The examiner can normally be reached on M-F, 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Beausoliel can be reached on (703)305-9713. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

csm
March 18, 2004

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